REMARKS

Claims 1-6, 8-10, 12, 13, 16-18, 64, and 65 are pending. Claim 1 is an independent claim. Claims 19-63 were previously withdrawn in response to a requirement for restriction. Claims 11, 14, and 15 were previously cancelled without prejudice. Claim 7 is cancelled and claim 1 is amended in this response. No new matter is added. Reconsideration and allowance of the above-referenced application are respectfully requested.

35 U.S.C. § 101

Claims 1-10, 12, 13, 16-18 and 64-65 are rejected under 35 USC § 101 because the claimed invention is directed to non-statutory subject matter. Applicants respectfully disagree because, as explained below, the features of the claims are tied to a particular machine or apparatus, and are, therefore, statutory.

In rejecting claim 1 under 35 U.S.C. § 101, the Office Action states "The processor according [to] the claimed system carries out the application of algorithms and computations … and, therefore, involves the application of a judicial exception. Regarding inventions involving the application of a judicial exception, said application must be a practical application of the judicial exception that includes either a step of a physical transformation, or produces a useful, concrete, and tangible result. … In the instant claims, there is no step of physical transformation, thus the instant claims must recite a practical application; i.e. [sic] recite a useful, concrete, and tangible result. See MPEP 2106, in particular, Section IV…" *Office Action*, page 3, 1st paragraph.

Hence, in the opinion of the Office, the claimed operations that are performed by the claimed processor fall under the judicial exception and do not produce a transformation. On this basis alone, the Office contends that the operations are non-statutory. This contention contradicts the test articulated in a recent memorandum from the Deputy Commissioner for Patent Examination Policy to Technology Center Directors titled "Guidance for Examining Process Claims in view of *In re Bilski*" dated January 7, 2009. In that memorandum, a test for a method claim is whether the claimed method is (1) tied to a particular machine or apparatus, or (2) transforms a particular article to a

different state or thing. *Memorandum of January 7, 2009*, 3rd paragraph. The memorandum stated that this is called the machine-or-transformation test. *Id.*

In the present case, the operations performed by the claimed processor are tied to a machine, namely, the claimed processor, which is included in a machine, namely the claimed system. Thus, the claimed subject matter satisfies the "machine" prong of the "machine-or-transformation" test. For this reason, claim 1 and all claims dependent therefrom are statutory under 35 U.S.C. § 101.

In addition, Applicants respectfully submit that the claimed subject matter is statutory and is not a judicial exception. In this regard, claim 1 recites a system comprising a processor that is configured to perform operations. Thus, claim 1 is a system claim. The claimed system includes a processor. It is well known that systems and processors are structural devices that are statutory under 35 U.S.C. § 101. For this reason, the claimed subject matter is not a judicial exception, but instead, is statutory.

For at least the above reasons, Applicants respectfully request that these rejections be withdrawn.

35 U.S.C. § 103

Claims 1-10, 12, 13, 16-18 and 64-65 are rejected under 35 USC § 103(a) as being unpatentable over Pfeifer (CIRP Annals-Manufacturing Technology, vol. 51 (2002) pages 455-458) in view of Vol'pov (Soviet Journal of Quantum Electronics, vol. 20 (1990), pages 1517-1522). The amendments to claim 1 obviate these rejections.

Specifically, for example, the proposed combination of Pfeifer and Vol'pov does not describe or suggest that the input signal is in a spatial domain, that the expressor function is in a spectral domain, and that the input signal is converted from the spatial domain to the spectral domain for the active interferometric analysis. Neither Pfeiffer nor Vol'pov describes or suggest these features of amended claim 1.

In this regard, Pfeifer describes a procedure for the assessment of the measurement uncertainty of interferometers with the help of a virtual instrument, the so-called "Virtual Interferometer." *Pfeifer* at Abstract. As stated in the reply filed on October 14, 2008, because Pfeifer simulates interferometric measurement of a physical interferometer, Pfeifer is not capable of performing interferometric analysis. *Reply to*

the Office Action of June 11, 2008, page 22, lines 23-25. In response to these statements, the Office asserts that the feature "performing active interferometric analysis on the received input signal" does not exclude a virtual interferometer or analysis of date from a virtual interferometer. *Office Action*, page 9, 3rd paragraph. In this regard, the Office Action states:

> In response, the limitation of "performing active interferometric analysis" does not exclude analysis done on a signal from a virtual interferometer. Absent a limiting definition in the specification, the limitation "interferometric analysis" broadly embodies analysis carried out by an interferometer or analysis of signals from an interferometer. The limitation does not exclude a virtual interferometer or analysis of data from a virtual interferometer.
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> *Office Action*, page 9, 3rd paragraph.

Thus, the Office asserts that "interferometric analysis," as recited in claim 1 can be either analysis of a signal by an interferometer or analysis of signals from an interferometer. In light of the amendments to claim 1, applicants respectfully request that the Office reconsider this interpretation of the claimed feature for the reasons described below.

Amended claim 1 describes performing interferometric analysis on an input signal within an arrayed signal pattern generated from a device. Amended claim 1 also recites a group of devices, one of which generates the arrayed signal pattern. None of the devices recited in claim 1 is a real or virtual interferometer. Thus, claim 1 clearly recites that the signal is not received from an interferometer. Because the signal is not received from an interferometer, the inescapable interpretation of the claimed interferometric analysis is that the analysis of the input signal is performed by an interferometer. Therefore, Applicants respectfully submit that the Office reconsider its interpretation that the claimed "interferometric analysis" is encompasses analysis carried out by an interferometer and analysis of signals from an interferometer, and interpret that the claimed analysis pertains only to analysis by an interferometer.

Amended claim 1 recites performing active interferometric analysis on the received input signal. Pfeifer does not describe or suggest interferometric analysis, as recited in claim 1. The Office asserts that no evidence has been provided in support of this assertion regarding Pfeifer. *Office Action*, page 10, 4th paragraph. The evidence is

presented herein. Instead of performing interferometric analysis, Pfeifer describes an approach for a systematic investigation of errors in an interferometer that includes the simulation of interferometric measurements in a virtual environment. *Pfeifer*, page 455, col. 1, 5th paragraph. Thus, Pfeifer describes simulating interferometric analysis rather than performing interferometric analysis. Further, using ray-tracing software, Pfeifer calculates optical path difference and fringe patterns, whereby Pfeifer analyzes the ray propagation until the energy of a ray falls below a given threshold or until a given distance is exceeded. *Id.* at col. 2, 4th paragraph. Additionally, Pfeifer uses finite element analysis to simulate the effect of temperature variations on a physical interferometer. *Id.* at col. 2, last paragraph. Clearly, Pfeifer does not perform interferometric analysis, but only simulates the propagation of light through a virtual interferometer using ray-tracing software and similarly, simulates the effect of temperature variations using finite element analysis. For these reasons, contrary to the Office's position, Pfeifer does not perform interferometric analysis on a received signal.

The Office asserts that because Pfeifer simulates interferometric measurements in a virtual environment in a computer to reproduce physical interferometric measurements, Pfeifer discloses performing active interferometric analysis via a computationally induced interference mechanism, as claimed. *See Office Action*, page 5, 3rd paragraph. Applicants respectfully request that the Office reconsider this position in light of previous explanations and for the following reasons. Specifically, Pfeifer teaches using a computer to simulate the operations of a physical interferometer by using ray-tracing software and finite element analysis software, such as ANSYS. Thus, Pfeifer does not teach the claimed interferometric analysis. Further, it cannot be concluded that Pfeifer teaches the claimed computationally induced interference mechanism simply because Pfeifer uses a computer to simulate interferometry. Although Pfeifer uses a computer, it does so only to model the components of an interferometer in 3D (*Pfeiffer*, page 456, col. 1, 2nd paragraph), to employ ray-tracing software, and for finite element analysis, all of which study the effect on an interferometer performing interferometric analysis, and do not perform interferometric analysis itself. Specifically, no portion of Pfeifer describes computationally inducing

interference to perform interferometric analysis on an input signal within an arrayed signal pattern generated by a device.

Further, the Office equates the temperature variations that Pfeifer considers in virtually simulating interferometry with the claimed event of interest. For the reasons that follow, Pfeifer's temperature variations are not the claimed event of interest. Firstly, as described previously, Pfeifer does not perform interferometric analysis, as claimed. Secondly, note that as claimed the arrayed signal pattern has an event of interest which is obtained by performing interferometric analysis. Pfeifer does not obtain temperature using the virtual interferometer. Rather, Pfeifer obtains the effect of temperature on an interferometer by modeling the temperature variations in the virtual interferometer. *Id.* col. 2, 3rd paragraph. Because Pfeiffer obtains an effect of an event on an interferometer rather than obtaining an event by performing interferometric analysis, Pfeifer does not describe or suggest "performing active interferometric analysis on the received input signal using an expresser function in a spectral domain to detect the presence of an event of interest within the arrayed signal pattern via a computationally induced interference mechanism," as recited in claim 1.

In addition, amended claim 1 recites the features of claim 7. The Office asserts that because Pfeifer teaches that interferometers are used for the inspection of optical components or wafers in the semi-conductor industry, and because the claimed glass-based arrays and thin film arrays can be examples of optical components, Pfeifer teaches the claimed devices. Applicants respectfully request that the Office reconsider this position. Pfeifer describes the application of interferometers to optical components. No portion of Pfeifer describes receiving an input signal within an array signal pattern generated by an optical component. Therefore, while Pfeifer broadly describes the applications of interferometers in optical components, Pfeifer does not describe receiving an array signal pattern from any optical component. Even assuming that Pfeifer did receive any signal, as described previously, because Pfeifer does not describe performing interferometric analysis, Pfeifer could not process any signal as claimed.

Additionally, no portion of Pfeifer describes or suggests that the input signal is in a spatial domain, that the expressor function used to perform interferometric analysis is

in a spectral domain, and that the input signal is converted from the spatial domain to the spectral domain. Thus, Pfeifer does not describe all the features of claim 1. Vol'pov does not rectify the deficiencies of Pfeifer. Specifically, for example, Vol'pov does not describe receiving an input signal within an arrayed signal pattern generated by any one of the devices listed in amended claim 1. Because Vol'pov describes receiving light describing a single object, Vol'pov does not describe receiving an input signal including events of interest within an arrayed signal pattern. Further, because Vol'pov does not receive an input signal including events of interest, Vol'pov certainly does not describe obtaining the event of interest from the input signal.

Furthermore, for reasons explained in the reply filed on October 14, 2008, Applicants respectfully re-submit that combining Pfeifer with Vol'pov will require modifying the principle of operation of either Pfeifer's virtual interferometer or Vol'pov's spectrum synthesizing features. As described previously, Pfeifer does not describe performing interferometric analysis. Rather, Pfeifer simulates the operations of a physical interferometer using a virtual interferometer. Thus, to combine Vol'pov's spectrum synthesizing features into Pfeifer, Pfeifer's simulation principles need to be modified to accommodate Vol'pov's spectrum synthesizing features. No portion of Pfeifer describes such a modification as being possible or desirable. Conversely, to enable Vol'pov to simulate the operations of a virtual interferometer, Vol'pov's spectrum synthesizing principles need to be modified. No portion of Vol'pov describes such a modification as being possible or desirable. Such modification will require a substantial reconstruction and redesign of the elements shown in the primary reference as well as a change in the basic principle under which either Pfeifer or Vol'pov was designed to operate. As described in the MPEP, in case of such modification, the teachings of the references are not sufficient to render the claims *prima facie* obvious. Because the proposed combination of Pfeifer and Vol'pov will require a modification of the principle of operation of the references, the proposed combination does not render claim 1 *prima facie* obvious.

CONCLUSION

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the remarks made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the application is in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

Applicant asks that all claims be allowed. Please apply any credits or charges to deposit account 06-1050.

Respectfully submitted,

Date: April 30, 2009

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